U.S. Fish & Wildlife Service

Abernathy Fish Technology Center Newsletter

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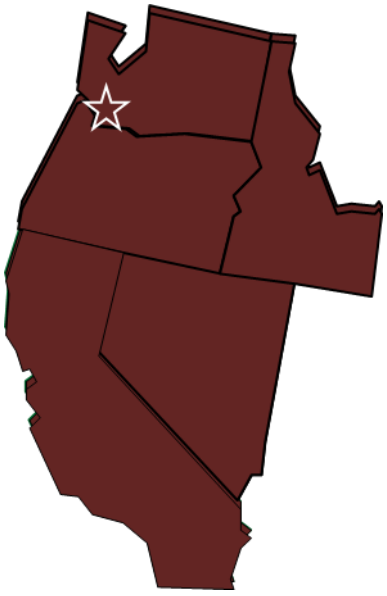
In this issue:



Serving the Pacific and Pacific Southwest Regions

AFTC Talent Transfers to FAC Program

Scott Gronback and Judy Gordon. Photo: AFTC

It was "see you later" instead of goodbye but still tough to watch Judy Gordon leave Abernathy after serving 13 years as Center Director. Judy first came to AFTC in 1998 from Alaska. She served as AFTC Deputy and field supervisor in the RO before taking over as Director in 2003. Judy helped to develop AFTC from a fairly small FTC with less than 15 employees to a well-respected science center with over 25 staff and three applied research programs. She has had a tremendous influence on employees at AFTC including several who have gone on to positions as senior scientist (Don Campton) and in management including: one FRO project leader (Denise Hawkins), two FRO Deputies (Bill Gale and Bill Ardren), and a FTC Deputy (Ken Ostrand). Some scientists who began their FWS careers at AFTC returned for Judy's going away party and several others participated through cards and emails.

We lost another vital member of the AFTC management team this spring when the RO convinced Scott Gronbach to leave AFTC and put his enormous talents to work serving the entire FAC Program instead of a single facility. Scott takes with him loads of experience with project management, a work ethic as strong and untainted as anyone we've ever met, and a passion for ensuring staff, facilities,

and fish remain safe. We will miss you more than you will ever know, Scott. Or perhaps you do know given all the phone calls and emails you still receive from us!

AFTC Presents Research at the Science of the Service Symposium

AFTC participated in the Region's inaugural *Science of the Service* symposium to learn about the range of scientific information being generated by FWS colleagues and to network with folks outside the usual FAC circle. AFTC staff members were selected to provide four of the diverse array of presentations by Pacific Region employees. The presentations were:

The efficacy of using electrical waveforms to kill the embryos of invasive Common Carp at Malheur Lake – William G. Simpson.

Assessing recovery units, how genetic data from Spalding's Catchfly have shaped the picture – Brice Adams.

A practical approach to modeling climate change vulnerabilities at National Fish Hatcheries – Kyle Hanson.

Overview of nutritional research for captive rearing of the endangered Lost River Sucker, Deltistes luxatus – Ron Twibell.

AFTC Program Highlights

Administration/Facilities

Patty Crandell and Pat DeHaan returned from filling in at the FAC Program in the Pacific RO. Pat filled in as the Fish Habitat Coordinator, and Patty filled in as Field Supervisor. They both thought working in the RO was a great experience and enjoyed meeting many new people but are glad to be back at AFTC.

AFTC staff took part in a very interesting and very useful two-day retirement training conducted by Robert Gregori from HR in the RO. Thanks Robert!

AFTC supervisors have completed mid-term performance reviews.

Vince Bocci and Patty Crandell sent their edits for the John Day Mitigation Statement of Work and Budget to

Staff:

Administration & Facilities

Center Director, Vacant
Patty Crandell, Acting Center Director
Vince Bocci, Administrative Officer
Steve Dyer, Administrative Assistant
Mark Hack, IT Specialist
Facilities Operations Specialist, Vacant
Jeff Poole, Water Treatment Plant Operator
Jim Lowell, Maintenance Worker

Conservation Genetics

Christian Smith, Regional Geneticist & Program Head
Pat DeHaan, Conservation Geneticist
Matt Smith, Conservation Geneticist
Justin Bohling. Conservation Geneticist
Jennifer Von Bargen, Lab Geneticist
Brice Adams, Conservation Geneticist
Mikki Brinkmeyer, Biological Science Technician
Ben M. Prom, Biological Science Technician

Physiology & Nutrition

Kyle Hanson, Regional Physiologist & Program Head
Ann Gannam, Regional Nutritionist
Richard Glenn, Microbiologist
John Holmes, Fish Biologist
Ron Twibell, Fish Nutritionist
James Barron, Fish Biologist
Kelli Hawke, Biological Science Technician
Kieslana Wing, Contractor

Quantitative Ecology & Technology

Doug Peterson, Senior Scientist & Program Head
Ben Kennedy, Fish Ecologist
Will Simpson, Fish Ecologist
Kurt Steinke, Electronics Engineer

Program Highlights— continued

the Columbia River Gorge Fisheries Complex (Gorge Complex).

Patty Crandell participated in a call to help plan the FY16 FAC project leader's meeting, September 7-9. She will be helping the agenda subcommittee come up with options for the agenda.

Patty Crandell met with Denise Hawkins, Project Leader for the Western WA FRO to discuss cooperative projects.

Patty Crandell took part in the FAC data management survey and participated in a phone call to capture extra information.

Patty Crandell had a meeting with Mara Zimmerman (WA Department of Fish and Wildlife, WDFW) to discuss AFTC water withdrawal in Abernathy Creek because of interest by the SFRB (Salmon Recovery Funding Board) monitoring panel. Patty and Mara also discussed having an Abernathy Creek research workshop again this summer (WDFW folks are very interested in this). Doug Peterson will be planning the workshop with Mara.

Conservation Genetics

Jennifer Von Bargen ran a total of four Chinook salmon rapid response events for Livingston Stone NFH. She analyzed 65 rapid response fish and 26 non-rapid response fish.

Jennifer also conducted the first ever RAD sequencing library prep in the Conservation Genetics Lab. The library prep prepared bull trout samples for next-generation RAD sequencing at the University of Oregon genomics center.

Mikki Brinkmeyer conducted a thorough analysis of multiplex PCR conditions for bull trout and re-optimized standard laboratory protocols to increase genotyping efficiency.

Physiology & Nutrition

For the project "Natural Reproductive Success and Demographic Effects of Hatchery-Origin Steelhead in Abernathy Creek, Washington", trapping of returning adult steelhead has resulted in a total of 142 steelhead captured (82 natural origin, 33 hatchery origin, and 27 out-of-basin hatchery origin). Fifteen natural origin and 21 hatchery origin adults were retained for brood stock with the goal of releasing 7,200 smolts in the spring of 2017. Sixty seven natural origin and four hatchery origin adults were released upstream to spawn naturally. Richard Glenn has been taking blood, egg, and ovarian fluid samples from female steelhead that are included in the brood stock as part of the maternal effects project.

Also for the project "Natural Reproductive Success and Demographic Effects of Hatchery-Origin Steelhead in Abernathy Creek, Washington", the first release of 5,800 brood year 2015 steelhead smolts occurred on April 19. The second release will occur on May 3, and the final release will occur on May 17. On the day before each release, Richard, Ben Kennedy, and Kelli Hawke collected gill biopsies to determine seawater preparedness of hatchery produced smolts.

For Fish Feed Quality Control (FFQC) sampling, eight feed samples were received from the hatcheries in March and three samples were received in April. As part of the routine analyses, feeds were checked for rancidity. Ann Gannam wrote the feed memos which were sent to the hatchery and the feed mill. Ron Twibell sent the second quarter FFQC report to NFH managers and Washington, Oregon, California, Idaho, and Canadian fish managers

As a continuation of the Chelan PUD lamprey project, James Barron is maintaining the lamprey in the grow-out portion of the study and all lamprey were inventoried in March. James also has begun construction on a new lamprey rearing system in the hatchery that will double the current rearing space for this species. The final report for the lamprey survival bottleneck study has been submitted to Chelan PUD.

The terminal sampling of the Chinook salmon in the recirculating aquaculture system occurred in April. Ann Gannam, Richard Glenn, Ron Twibell, and Kelli Hawke conducted the sampling of the fish that included taking gill biopsies, blood biopsies, whole bodies, lengths, and weights. Final weigh sampling was also conducted in by Ann Gannam, Ron Twibell, Kelli Hawke, and James Barron.

Program Highlights— continued

Richard Glenn and Kyle Hanson assisted in the installation of PIT-tag antenna arrays at the mouth of Abernathy Creek and at the bridge by AFTC.

Kyle Hanson presented a talk titled, "USFWS Sturgeon exchange to China" to the staff at AFTC. The talk highlighted his participation in a conservation exchange where FWS staff traveled to China to discuss efforts to conserve endangered Chinese sturgeon (*Acipenser sinensis*).

Quantitative Ecology &Technology (QET)

March and April were very busy months for the QET program. The program designed, built and installed four top of the line impact-resistant high density polyethylene (HDPE) PIT (passive integrated transponder) tag antennas at AFTC. These large (4' x 17.5') antennas were installed in pass-over orientation and should have the greater ability to detect PIT-tagged fish than we have ever had at the interrogation site adjacent to the station. Additionally, they should be durable enough to be operated throughout the winter and withstand the impact of large boulders and trees that destroyed PVC-type antennas installed in years past.

The FWS delegation to China at the Forbidden City in Beijing. Photo Credit: FWS

After completing this significant undertaking we are now in the process of collecting data on the migration behavior of steelhead smolts.

In addition to the installation of antennas at AFTC, the program once again installed a PIT tag array near the confluence of Abernathy Creek and the Columbia River. This antenna array is located just downstream of a WDFW operated screw trap and is used to collect information on the migration behavior of PIT tagged steelhead and coho salmon in the lower portion of the creek. It also provides additional data that can be used to supplement the data used to determine the efficiency of the screw trap.

Will Simpson and Kurt Steinke successfully operated and maintained remote PIT tag antenna arrays on the Umatilla River in northeast Oregon. AFTC uses these antenna arrays to estimate entrainment and survival of ESA-listed juvenile steelhead diverted into irrigation canals.

Joelle Blais, who completed a

Publications

Lampman, R., M. L. Moser, A. D. Jackson, R. K. Rose, A. L. Gannam, and J. M. Barron. 2016. Developing techniques for artificial propagation and early rearing of Pacific Lamprey (*Entosphenus tridentatus)* for species recovery and restoration. Chapter 22, pp 160-195. In A.M., Orlov and R. J. Beamish, editors. Jawless Fishes of the World. 2 volumes. Cambridge Scholars Publishing, Cambridge, UK.

Lesica, P., B. Adams, and C. T. Smith. 2016. Can physiographic regions substitute for genetically-determined conservation units? A case study with the threatened plant, *Silene spaldingii.* Conservation Genetics:14. Available: http://link.springer.com/article/10.1007/s10592-016-0842-5

Reports

Barron, J., R. Twibell, A. Gannam, and K. Hanson. 2016. Development of artificial propagation methods for production of juvenile Pacific lamprey (*Entosphenus tridentatus*) for the use in research associated with Section 4.2.3 of the Rocky Reach Pacific Lamprey Management Plan. AFTC Annual Report for the Chelan PUD, Wenatchee, WA.

Program Highlights — continued

Directorate Fellowship Program (DFP) last summer at AFTC, gave a brown bag presentation on her senior capstone project at the University of Washington's School of Fisheries and Aquatic Sciences. Her presentation was titled "The Effects of Temperature and Electrofishing Procedures on the Physiology of Juvenile Steelhead Trout (*Oncorhynchus mykiss)"* and presented results from an experiment she conducted as a DFP.

In the next column is a picture of a new antenna being electrofused for AB1 PIT tag array under the Abernathy Creek bridge. The antenna is 17.5' long and is constructed of impact-resistant high density polyethylene (HDPE). This configuration (butterfly) is designed to reduce the effects of electrical noise on detection performance . Photo next column by QET.

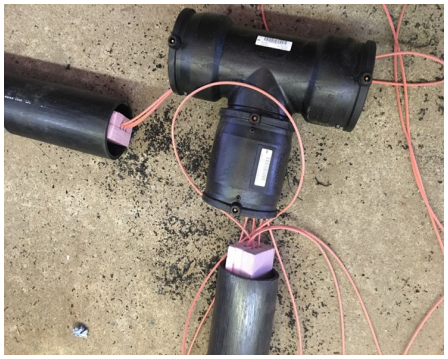
Outreach

Ann Gannam set-up and manned the AFTC Earth Day booth at the Longview Earth Day celebration on April 18. The booth was visited by over 200 kids with their parents.

Will Simpson gave a career day talk about being a fisheries biologist at Alki Middle School, Vancouver, WA.

Waterproof housing for PIT tag transceiver designed by Kurt Steinke, Electronics Engineer. Photo: QET

Butterfly antenna for AFTC bridge. Photo: QET



Picture showing complicated wiring involved in the butterfly antenna. Photo: QET

Meetings and Conferences

In early March, Doug Peterson participated remotely in the Umatilla Management, Monitoring, and Evaluation Oversight Committee meeting and presented design options for a large antenna array to detect downstream migration of juvenile Pacific lamprey in the lower Umatilla River.

Kyle Hanson participated in the Pacific Lamprey Regional Implementation Plan Meeting for the Lower Columbia Regional Management Unit.

Pat DeHaan attended the Oregon chapter AFS meeting in Seaside, OR where he presented on-going collaborative research on Warner sucker genetics. Co-authors on the presentation were Jennifer Von Bargen and Paul Scheerer of ODFW.

All staff finished FISSA training.

AFTC staff participated in safety training: Extinguisher Training and Electric Weir Awareness Training.

Vince Bocci, Steve Dyer, and Patty Crandell participated in four days of Administrative Training offered by the RO in Portland, OR.

Ann Gannam, Ron Twibell, and Patty Crandell attended the Gorge Complex Hatchery Evaluation Team meeting at Carson NFH

Program Highlights — continued

Doug Peterson right puts finishing touches on anchors. Left Kyle Hanson. Photo: QET

Screw trap operated by Washington Department of Fish and Wildlife.

Photo: QET

Picture of final product of PIT antenna at AFTC bridge. Photo: QET

Ongoing Projects

Water Velocity Effects on Salmon as Reared in Recirculating Systems. *Management Need:* Determine the effects of water velocity on composition, growth, condition, and performance of juvenile PNW salmon as applied to recirculating systems in support of hatcheries in the Pacific Region considering the use of recirculating systems. *Partners:* Pacific Region National Fish Hatcheries, Fishery Resources Program via Fisheries Operations and Need System (FONS).

Diet development for Lost River and short nose suckers in the Klamath River Basin. *Management Need*: Determine dietary needs of listed populations to assist in recovery. *Partners*: Klamath Tribes, Klamath Falls FWO, California/Nevada FHC.

Development of diets and rearing techniques for the culture of Pacific lamprey, *Entosphenus tridentatus*. *Management Need*: Assist Tribal partners in developing methods for the artificial propagation of Pacific lamprey, a species of concern. *Partners*: Yakama Nation; Fishery Resources Program via FONS.

Assessing the effects of multiple tagging methods on Pacific lamprey ammocoetes. *Management Need*: Assist Tribal partners in developing methods for the monitoring and evaluation of this species of concern. *Partners*: Yakama Nation; Fishery Resources Program via FONS.

The physiological response of white sturgeon to handling stress in captivity. *Management Need*: Determine if the stress from catch and release angling is detrimental to survival of white sturgeon, a species of concern. *Partners*: Dalhousie University; Carleton University.

Pacific Region's Fish Feed Quality Control (FFQC) Program. *Management Need*: The FFQC Program, the only one of its kind in the FWS, provides quarterly monitoring of the quality of the commercially produced fish feeds used at Pacific and Pacific Southwest Regions' NFHs. Information is compiled on an annual basis and used in the development of the Pacific Region fish feed contract. *Partners:* Pacific and Pacific Southwest Region's NFHs, Oregon, Washington, Idaho, and Tribal fish hatcheries.

Effects of dietary lipid source and ultraviolet radiation on sunburn and steatitis in Steelhead, *Oncorhynchus mykiss*. *Management Need:* Provide information regarding the potential relationship between fish nutrition and sunburn in steelhead. *Partners*: Pacific Region National Fish Hatcheries

Evaluation of thermal exposure of adult Chinook salmon during the migration to Warm Springs National Fish Hatchery. *Management Need:* Determine if Chinook salmon migrating to Warm Springs National Fish Hatchery experience thermal stress. *Partners*: Warm Springs National Fish Hatchery, Lower Columbia Fish Health Center, Confederated Tribes of Warm Springs.

Natural reproductive success and demographic effects of hatchery-origin steelhead in Abernathy Creek, WA. *Management Need*: Provide information to help managers minimize differences between NOR and HOR fish. *Partners*: Bonneville Power Administration; Washington Department of Fish and Wildlife.

Climate change vulnerability assessments of Pacific Region National Fish Hatcheries. *Management Need:* An understanding of the anticipated habitat changes under different climate change scenarios provides managers with information to proactively respond to these conditions and their impact on NFHs. *Partners*: Pacific Region NFHs; Mid-Columbia River FRO; Fishery Resources Program via FONS.

Watermark: Sturgeon. Photo credit: J. Strickland

Ongoing Projects—continued

Fish Suppression of common carp in Malheur Lake using electrofishing to target eggs and embryos. Management Need: Determine the feasibility of using electrofishing to kill eggs and embryos for control of invasive common carp in Malheur Lake. Partner: Malheur NWR.

Antenna design for the Biomark IS1001 PIT tag reader. Management Need: Provide expert level engineering and technical assistance to partners monitoring species of interest using new technologies while reducing biologist time spent in design and troubleshooting. Partner: NOAA Fisheries, USFWS Green Bay.

Entrainment and bypass of ESA-listed salmon at irrigation diversions on the Umatilla River. Management need: Determine what environmental factors influence the magnitude of fish entrainment into irrigation canals and if captured fish are successfully screened and returned to the Umatilla River using PIT tag technology. Partner: Bureau of Reclamation

Aquatic organism passage (AOP) at remediated stream road crossings. Management Need: Assess the efficacy of genetic, direct capture, and remote sensing methods to verify fish passage through remediated culverts. Partners: US Forest Service, Trout Unlimited.

Mekong River fish ecology and sustainable development. Management Need: Assess the scientific capacity and data needs for resource managers in Laos and Cambodia to address hydroelectric development on the mainstem Mekong River. Partners: USGS, US DOI International Technical Assistance Program (ITAP)

Effectiveness of transitioning to a locally-sourced steelhead broodstock at Winthrop National Fish Hatchery. Management Need: Determine if hatchery improvement programs and actions are achieving the expected biological performance objectives. Partners: USFWS Mid-Columbia FRO and NOAA Fisheries.

Stress response of juvenile steelhead salmon to electrofishing and tagging under different thermal regimes. Management need: To understand how fish respond to capture and handling under conditions experienced in late summer. Partners: USFWS Directorate Fellows Program.

Evaluation of the spatial and temporal distribution of juvenile Chinook Salmon in the Entiat River. Management Need: Use genetic data to improve our understanding of the distribution of spring and summer run Chinook Salmon juveniles and thus improve our ability to prioritize restoration projects targeting spring Chinook Salmon recovery. Partners: USFWS Mid-Columbia FRO

Design and installation of a PIT tag array to monitor outmigration of juvenile Pacific lamprey in the Umatilla River. Management need: Determine entrainment rates of juvenile lamprey as they move downstream through the Umatilla River. Partners: NOAA-Fisheries, US Bureau of Reclamation

Rapid response genetic analysis of threatened bull trout collected below dams in the Clark Fork River, MT. Management Need: Provide data to inform upstream fish passage decisions for listed bull trout. Partners: Avista Corporation; Confederated Salish Kootenai Tribes; Idaho Fish and Game; Kalispel Tribe of Indians; Montana Fish Wildlife & Parks; Montana Ecological Services Field Office; Pend Oreille Public Utility District; Pennsylvania Power & Light, MT.

Genetic identification of endangered winter-run Chinook salmon in the Sacramento River, CA. Management Need: Rapid response broodstock identifica onfor spawning of listed species. Partners: Livingston Stone NFH; Red Bluff FWO; NOAA Fisheries.

Ongoing Projects—continued

Population genetic structure of Spalding's catchfly: a terrestrial plant. Management Need: Develop genetic markers and monitor diversity of populations to identify management units and inform conservation planning. Partners: Idaho FWO; University of Idaho.

Montana.Genetic analysis of bull trout in the Lewis River system. Management Need: Facilitate passage of bull trout past hydroelectric facilities. Partners: Washington FWO, Columbia River FPO, PacifiCorp, US Forest Service, Washington Department of Fish and Wildlife.

Relative reproductive success of hatchery and wild steelhead in the Deschutes River basin. Management Need: Develop genetic markers to monitor genetic diversity of listed populations. Partners: Oregon Department of Fish and Wildlife, Idaho Department of Fish and Game, Columbia River Intertribal Fish Commission.

Genetic needs assessment for endangered Lost River and shortnose suckers of the Klamath River Basin, OR. Management Need: Develop genetic markers to monitor genetic diversity of listed populations. Partners: Klamath Falls FWO; U.S. Geological Survey.

Use of restriction-associated DNA sequence data for single nucleotide polymorphism detection in listed Devil's Hole pupfish. Management Need: Develop genetic markers to monitor genetic diversity of a listed population held in refugia. Partners: Sacramento FWO; University of California, Davis.

Genetic profiles of broodstock at Pacific Region National Fish Hatcheries. Management Need: Determine impacts of hatchery origin fish (HOR) on naturally occurring fish (NOR) and monitor the effects of aquaculture practices on HOR populations. Partners: Pacific Region NFHs; Fishery Resources Program via FONS.

Genetic run assignment of juvenile Chinook salmon from the American River. Management Need: Assess accuracy of length-at-date method for distinguishing Spring run (ESA listed) from Fall run (unlisted) Chinook salmon smolts. Partner: Pacific Southwest Regional Office.

John Holmes and Kelli Hawke first release of AFTC steelhead. Photo: AFTC

AFTC steelhead before released into Abernathy Creek. Photo: AFTC